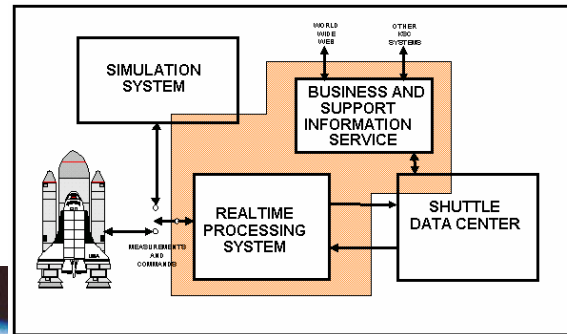


Verification for Next-Generation Space Shuttle



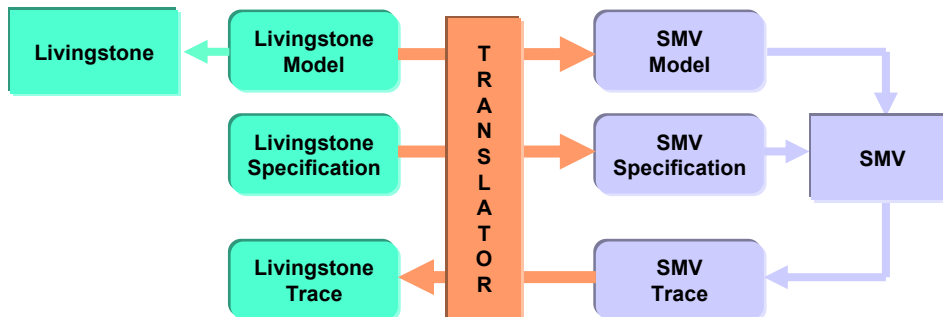
Goal: support V&V of integrated vehicle health maintenance (IVHM) for next-generation space vehicles

Approach: provide survey of

- Past NASA software V&V: DS-1 Remote Agent, shuttle CLCS, X-37 IVHM experiment
- Formal Methods: cost/assurance tradeoff, applicability
- NASA Ames tools for V&V of model-based diagnosis

Output: three reports

<http://ase.arc.nasa.gov/vvivhm>



Explanation



- POC: Charles Pecheur (RIACS)
- Background: Northrop Grumman Corp. (NGC) is leading the development of a comprehensive, integrated framework for designing and deploying Integrated Vehicle Health Management (IVHM) systems, as a technology demonstration for a next-generation space shuttle. Their approach gives an important role to model-based diagnosis systems such as NASA's Livingstone system. NGC has partnered with NASA Ames to assess the V&V needs and suggest V&V solutions for that class of systems
- Accomplishment: A paper was presented at the Goddard FAABS'02 (Formal Aspects of Agent-Based Systems) workshop (Greenbelt, MD, Oct 02), the workshop proceedings will appear as a volume of the Springer LNCS Series. It describes the survey prepared for Northrop as part of an overall project on V&V of model-based reasoning. The survey was performed in the first phase of the NGC project. Results were delivered to NGC as three reports in January 2002. Copies are available on-line as shown. This survey is described in an paper Future Plans: this project is now in the second phase. Ames is now maturing its verification tools and integrating them in NGC's IVHM architecture. Improvements focus on improving usability, in particular through the development of graphical user interfaces and more extensive documentation.
- Shown on slide: the survey presented here was performed at NASA Ames in support of developing V&V methods within the IVHM (integrated vehicle health management) architecture development project lead by Northrop Grumman Corp. (NGC). The graphics highlight two components of the survey: the top part shows the three NASA projects (DS-1, CLCS, X-37); the bottom part shows the Livingstone-to-SMV translator, as one of the two Ames tools for verification of diagnosis systems.